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Alfons Gail

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09/12/2005

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EXAMINER

KYLE, MICHAEL J

ART UNIT

PAPER NUMBER

3677

DATE MAILED: 09/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/832,637

Applicant(s)

GAIL ET AL.

Examiner

Michael J. Kyle

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5, 7-13, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Werner (WO98/53229) in view of Reluzco et al (U.S. Patent No. 6,168,162). With respect to claims 1 and 2, Werner discloses a brush seal comprising a bristle housing (2) press fit on the stator and including a cover plate (3) and a supporting plate (4), bristles (5), circumferential surface (9), two side surfaces (vertical portions of 3 and 4), a first positioning arrangement on a side surface (portion of 4 abutting 2), and a second positioning arrangement on a rotor (portion of 2 abutting 4). The bristle housing is secured against movement in a radial direction relative to the stator. Werner fails the first and second positioning arrangements to be configured to interact with each other in a positive locking manner providing definite positioning of the bristle housing.

3. Reluzco teaches a brush seal comprising a bristle housing (18, 20) arranged on a stator and including a cover plate (18) and support plate (20)(see figure 7). Examiner notes multiple embodiments in Reluzco, where the plates are referenced with numerals 18a, b, c and 20a, b, c. Examiner will refer to all of the plates in the embodiments generally as 18 and 20. The bristle housing further comprises a circumferential surface (top surface of plates, where bristles are fastened) and two side surfaces (axial outer faces of 18 and 20, facing away from the bristles). Bristles are formed in the bristle housing and include free ends oriented toward a rotor (bottom

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of figure 7). A first positioning arrangement (72) is provided on a side surface, and a second positioning arrangement is provided on the stator (portion receiving pin 72). The first and second positioning arrangements interact with each other in a positive locking manner and provide definite positioning of the bristle housing so as to prevent relative rotation and reversed mounting of the entire housing. The housing cannot be reversibly mounted as shown in figure 7, because the other plate does not have a slot 70, which would receive the pin 72. The pin, or project 72, has conical sections at its ends. It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Werner to include the pin 72 and slot 70 arrangement of Reluzco in order to prevent rotation of the bristle housing relative to the stator.

4. With respect to claims 3-5, Werner discloses the cover plate and supporting plate are formed by non-cutting shaping and deep drawing (column 1, line 66). The bristle housing (2) is formed by flanging the cover plate and supporting plate.

5. With respect to claims 7 and 8, the combination of Werner and Reluzco discloses the first positioning arrangement includes an integral projection (72 of Reluzco) that projects beyond at least one side surface, and the second positioning arrangement includes a recess (70 of Reluzco) formed in the stator. The projection is engaged in the recess. Because the projection is integral with the cover plate, it stands to reason that it is formed during the forming of the cover plate during the non-cutting shaping of the cover plate described in Werner.

6. With respect to claim 9, Werner discloses a brush seal comprising a bristle housing (2) including a cover plate (3) and a supporting plate (4), bristles (5), circumferential surface (9), two side surfaces (vertical portions of 3 and 4), a first positioning arrangement on a side surface (portion of 4 abutting 2), and a second positioning arrangement on a rotor (portion of 2 abutting

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4). Werner fails to disclose the first and second positioning arrangements to be configured to interact with each other in a positive locking manner providing definite positioning of the bristle housing. Werner also fails to disclose that the first positioning arrangement includes an integral projection that is either lenticular or conical, the second positioning arrangement includes a recess, and that the integral projection is engageable in the recess.

7. Reluzco teaches a brush seal comprising a bristle housing (18, 20) arranged on a stator and including a cover plate (18) and support plate (20)(see figure 7). Examiner notes multiple embodiments in Reluzco, where the plates are referenced with numerals 18a, b, c and 20a, b, c. Examiner will refer to all of the plates in the embodiments generally as 18 and 20. The bristle housing further comprises a circumferential surface (top surface of plates, where bristles are fastened) and two side surfaces (axial outer faces of 18 and 20, facing away from the bristles). Bristles are formed in the bristle housing and include free ends oriented toward a rotor (bottom of figure 7). A first positioning arrangement (72) is provided on a side surface, and a second positioning arrangement is provided on the stator (portion receiving pin 72). The first and second positioning arrangements interact with each other in a positive locking manner and provide definite positioning of the bristle housing so as to prevent relative rotation and reversed mounting of the entire housing. The housing cannot be reversibly mounted as shown in figure 7, because the other plate does not have a slot 70, which would receive the pin 72. The pin, or project 72, has conical sections at its ends. It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Werner to include the pin 72 and slot 70 arrangement of Reluzco in order to prevent rotation of the bristle housing relative to the stator.

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8. Furthermore, it would be obvious to one having ordinary skill in the art to make the projection of a lenticular shape. A lenticular shape would eliminate the straight edges that are found on Reluzco. By eliminating corners, stress concentrations are reduced, thereby improving the durability of and increasing the work life of the piece. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the projections to be lenticular in shape, which reduces stress concentrations thereby improving the durability and work life of the piece.

9. With respect to claim 10, Werner discloses the cover plate to have a flanged section (7) and the supporting plate to have an axial section (portion of 4, below 7, extending left to right). The axial section extends beyond one of the side surfaces and is disposed at an end of the cover plate close to the circumferential surface. The flanged section encloses a free end of the axial section projecting radially beyond the free end of the axial section and forming an undercut (at 6).

10. With respect to claim 11, Werner discloses the flanged section (7) to include an inner side surface forming the undercut, the inner side surface being disposed at a distance from the side surface of the supporting plate. The portion of the inner side surface that forms the under cut is at a distance from the supporting plate.

11. With respect to claims 12 and 13, Werner, as modified by Reluzco's embodiment in figure 8, shows the first and second positioning arrangements (74, 76, 78, of Reluzco) to include at least one pair of holes (in stator, receiving 78, column 5, lines 29-30, discusses the use of multiple pins) in the stator in alignment with a pair of holes in the axial flange (76), where the

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pair of holes receive a fastener (78). The fastener is a bolt. It is noted that Merriam-Webster's Collegiate Diction, Tenth Edition, defines a "bolt" as "A metal rod or pin".

12. With respect to claim 15, Reluzco teaches the first and second positioning arrangements include a integral radial projection and (72) and a corresponding recess (70). The projection engages the recess to prevent relative rotation of the bristle housing.

13. With respect to claim 16, Reluzco teaches the first and second positioning arrangements include a plurality of integral radial projections and (72) and a corresponding recesses (70). The projection engages the recess to prevent relative rotation of the bristle housing. Reluzco, column 5, lines 29-30, states that only one pin (72) is required per segment. If multiple segments are used, then there will be a plurality of projections and recesses.

14. Claims 6, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Werner in view of Reluzco and Nakamura et al (U.S. Patent No. 6,106,190). Werner discloses a brush seal comprising a bristle housing (2) including a cover plate (3) and a supporting plate (4), bristles (5), circumferential surface (9), two side surfaces (vertical portions of 3 and 4), a first positioning arrangement on a side surface (portion of 4 abutting 2), and a second positioning arrangement on a rotor (portion of 2 abutting 4). Werner fails to disclose the first and second positioning arrangements to be configured to interact with each other in a positive locking manner providing definite positioning of the bristle housing. Werner also fails to disclose the first positioning arrangement to include a spot weld that projects beyond the circumferential surface, and the second positioning arrangement to be recess.

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15. Reluzco teaches a brush seal comprising a bristle housing (18, 20) arranged on a stator and including a cover plate (18) and support plate (20)(see figure 7). Examiner notes multiple embodiments in Reluzco, where the plates are referenced with numerals 18a, b, c and 20a, b, c. Examiner will refer to all of the plates in the embodiments generally as 18 and 20. The bristle housing further comprises a circumferential surface (top surface of plates, where bristles are fastened) and two side surfaces (axial outer faces of 18 and 20, facing away from the bristles). Bristles are formed in the bristle housing and include free ends oriented toward a rotor (bottom of figure 7). A first positioning arrangement (72) is provided on a side surface, and a second positioning arrangement is provided on the stator (portion receiving pin 72). The first and second positioning arrangements interact with each other in a positive locking manner and provide definite positioning of the bristle housing so as to prevent relative rotation and reversed mounting of the entire housing. The housing cannot be reversibly mounted as shown in figure 7, because the other plate does not have a slot 70, which would receive the pin 72. The pin, or project 72, has conical sections at its ends. It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Werner to include the pin 72 and slot 70 arrangement of Reluzco in order to prevent rotation of the bristle housing relative to the stator.

16. Nakamura teaches a projection (66b in figure 5b) on a first positioning element (66b) which fits into a recess (62b) of the second positioning element (60) to prevent the two elements from rotating with respect to one another. Nakamura et al further discloses an embodiment having a welded projection (W in figure 6b) that serves the same purpose as the projection in figure 5b. The projection (W), formed during a non-cutting shaping process also projects beyond one side surface and is lenticular in shape as claimed. Both projections function to prevent the

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first positioning arrangement, or the projection, from rotating with respect to the second positioning arrangement (60). Inasmuch as the references disclose these elements as art recognized equivalents, it would have been obvious to one of ordinary skill in the art to substitute one for the other. In re Fout, 675 F.2d 297, 301, 213 USPQ 532, 536 (CCPA 1982). One skilled in the art would incorporate such projections with the motivation to prevent the first positioning element from rotating with respect to the second positioning element.

17. Claim 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Werner in view of Reluzco, as applied to claim 1 above, and further in view of Hanrahan (U.S. Patent No. 5,066,025). Werner and Reluzco fail to disclose angled bristles. Hanrahan teaches that it is known in the art that bristles are usually located at an angle with respect to the radius for the purpose of maintaining proper sliding relationship with the rotor (column 1, lines 21-28). Where the range of article sizes disclosed in the prior art envelops the recited range, and there is no showing of criticality of the recited range, such recited range would have been obvious to one of ordinary skill in the art. In re Reven, 390 F.2d 997, 156, USPQ 679 (CCPA 1968).

Response to Arguments

18. Applicant's arguments with respect to all claims have been considered but are moot in view of the new ground(s) of rejection. All claims are now rejected based upon the combination of at least Werner (WO98/53229) and Reluzco. Because the grounds of rejection applied to claims 1 and 10-13, based on the combination of Werner (U.S. Patent No. 6,302,400) and Reluzco, in the previous Office Action were improper under 35 U.S.C. 103(c), this action is non-final.

Conclusion

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Kyle whose telephone number is 571-272-7057. The examiner can normally be reached on Monday - Friday, 8:30 am - 5:00 pm.

20. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Swann can be reached on 571-272-7075. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

21. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

mk



Chuck Y. Mah
Primary Examiner